Electronic Safe and Arm Fuzing Neutralization

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LONG-TERM GOAL

The long-term goal of this research is to identify and develop a capability for remote, standoff, non-intrusive capability for neutralization of electronic safe and arm fuzing (ESAF). Approaches are sought for both designing an external neutralization capability applicable to new fuze designs and imposing this capability on existing ordnance devices.

Unexploded Ordnance (UXO) presents a complex and difficult challenge to U.S. military and civilian personnel who must detect and neutralize thousands of different types of UXO including hundreds of different types of antipersonnel and antitank landmines as well as improvised explosive devices (IEDs), also known as booby traps. These personnel must conduct clearance operations in all types of environments, climates and terrain in hundreds of different scenarios. UXO is explosive ordnance that has been primed, fuzed and armed or otherwise prepared for action; that has been fired, launched, dropped, projected or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material, and remains unexploded either by design, malfunction or any other cause.

OBJECTIVES

The primary objective of this research is to provide a fundamental understanding of viable approaches to remote neutralization of unexploded ordnance (UXO) with electronic safe and arm fuzing. Viable approaches devised will then be demonstrated in prototype hardware under laboratory conditions. Fulfillment of this objective will fill the requirement to develop a method for remote, standoff, non-intrusive neutralization of electronic safe and arm fuzing (ESAF) capability imposed upon the U.S. Navy EOD Technology Division (NAVEODTECHDIV).

APPROACH

Approaches are sought for both designing an external neutralization capability applicable to new fuze designs and imposing this capability on existing ordnance devices. Ideally, such a capability would take advantage of circuits and components already common to ESAF design implementations. Whether based on existing fuze designs, modifications or incorporation of new techniques, methods of implementation must not impose unacceptable penalties on fuze design, manufacture or performance in terms of cost, complexity, volume, weight, reliability and jamming susceptibility. Standoff neutralization methods should be capable of being applied to new developmental fuzing systems and also to fielded equipment. Standoff neutralization requires some method whereby an emissive source

stimulates an unintended, or possibly intended, receiver to provide a desired response – in this case a switch-off or dudding function.

WORK COMPLETED

This project was a new start late in FY00. Consequently no significant work has been accomplished to date. A contract has been awarded Engineering Technology Incorporated (ETI) to perform this effort.

RESULTS

This project was a new start late in FY00. Consequently there are no results to date.

IMPACT/APPLICATIONS

If successful, this project will provide EOD technicians with a means of defuzing ordnance systems to minimize the threat posed by dud ordnance after hostilities cease. This has potential application for both EOD personnel (conducting UXO operations) and indigenous populations (humanitarian demining). It will also advance understanding of electromagnetic field effects on emplaced munitions.

TRANSITIONS

If successful, it is anticipated that knowledge gained techniques and systems developed, as a result of this effort, will transition to the weapons development community.

RELATED PROJECTS

One current ONR-funded project is closely related to this effort. The ongoing *ESAF Identification and Characterization Project* is being executed by ITT (formerly Stanford Telecomm) of Annapolis Junction, MD. ITT is studying and developing techniques to locate, identify, and obtain information about various EOD targets of interest using special proprietary radio frequency (RF)/radar techniques. The information gathered will be processed to determine the operational status of the targets.

REFERENCES

David R. Keene and Gus Bontzos, 1999. Electronic Safe and Armed Fuzing (ESAF) Monitor, Office of Naval Research, Ocean, Atmosphere, and Space Science and Technology Division, Ocean Engineering and Marine Systems 1999 Program annual reports, ONR 32100-2, December.